Center Independent Research & Development: GSFC IRAD

Supercooled Liquid and Mixed-phase Cloud Profiler (SLiM)

Completed Technology Project (2017 - 2018)

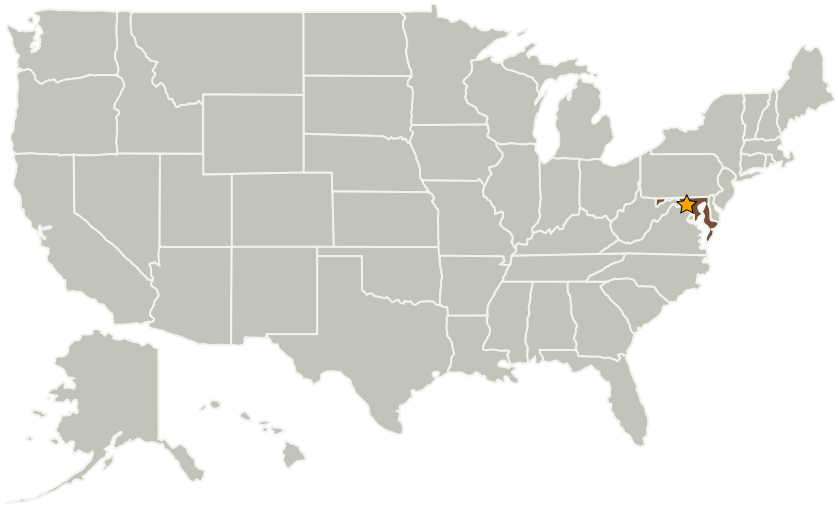
Project Introduction

The aim of this project is to define a suite of radars and radiometers for quantifying supercooled liquid water in mixed-phase clouds, focusing on millimeter and submillimeter-wave sensors for airborne, and eventually spaceborne, platforms. The primary focus is to determine the requirements of a G-band radar for observing mixed-phase clouds. Additional active and passive bands that will facilitate such measurements will be identified.

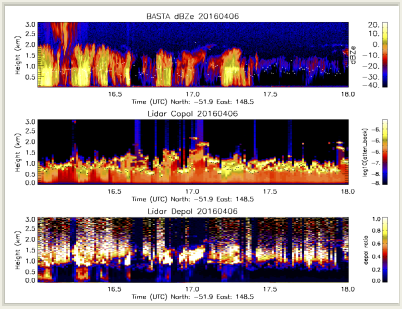
Anticipated Benefits

Given the importance of supercooled liquid in cloud microphysics, the global radiation budget, and aviation safety, the ability to observe these clouds globally would benefit weather prediction, expand understanding of cloud radiative forcing, and improve access to airspace for commercial and government aircraft. This project will provide a sensor suite concept and technology development path for quantifying this variable that is currently not widely measured.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland



Ground-based radar and lidar observations of mixed-phase clouds in theSouthern Ocean. The SLiM Cloud Profiler sensor concept aims to developremote sensing capabilities for measuring mixed-phase clouds fromairborne and spaceborne…

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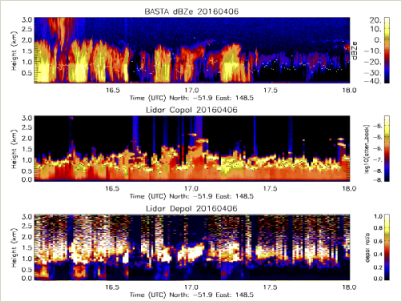
Primary U.S. Work Locations

Maryland

Images



SLiM Cloud Profiler Target Observations
Ground-based radar and lidar observations of mixed-phase clouds in theSouthern Ocean. The SLiM Cloud Profiler sensor concept aims to developremote sensing capabilities for measuring mixed-phase clouds fromairborne and spaceborne platforms.
(https://techport.nasa.gov/image/28223)

Organizational Responsibility

Responsible Mission Directorate:
Mission Support Directorate (MSD)

Lead Center / Facility:
Goddard Space Flight Center (GSFC)

Responsible Program:
Center Independent Research & Development: GSFC IRAD

Project Management

Program Manager:
Peter M Hughes

Project Managers:
Matthew J Mcgill
William E Cutlip

Principal Investigator:
Ian S Adams

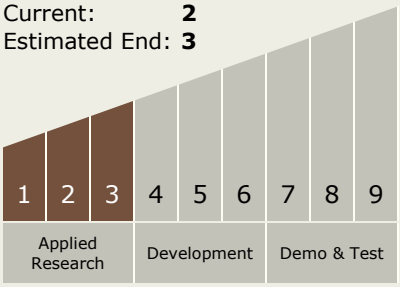
Co-Investigators:
Stephen J Munchak
Paul E Racette
Dongliang Wu
Gerald M Heymsfield
Lihua Li

Supercooled Liquid and Mixed-phase Cloud Profiler (SLiM)

Completed Technology Project (2017 - 2018)

Technology Maturity (TRL)

Start: **1**
Current: **2**
Estimated End: **3**



Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves

Target Destinations

Foundational Knowledge, Earth